

Optimizing Tuberculosis Care through Family Based Nursing Care: A Case Study Approach

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Abstract

Tuberculosis (TB) is a global health challenge that significantly impacts individuals and communities. Family-based care is recognized as an effective method to enhance TB management. The aim of this case study is to illustrate the implementation of family-based nursing care in a TB case to provide holistic care. The method used is a case study approach following the Family Nursing Model (FCN) theory by Friedman. A family with TB-diagnosed members was selected as the sample. The nursing care process was conducted over three months with bi-weekly routine visits. The care process included assessment, diagnosis, intervention, implementation, and evaluation stages. The results of this case study formulated the nursing diagnosis "Ineffective Health Maintenance in the Family of Mr. D". Interventions were based on the five family health tasks, namely understanding health issues through education about TB and the disease process; making informed decisions involving the family; providing care with support for the treatment program undergone by family members; adapting a healthy environment through hygiene behavior education; and utilizing health services through referral to community services. This nursing care illustrates integrated care practices with active family involvement, providing practical guidance to enhance TB treatment outcomes and management at the family level.

Keywords: Tuberculosis; Family-Centered Nursing; Nursing Process; Case Study; Indonesia



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Introduction

One of the diseases that often affects family life is tuberculosis (TB). To date, TB remains a major health issue both nationally and globally. This fact is reflected in the global TB report, which ranks TB as one of the leading causes of death worldwide (WHO, 2021). The high mortality rate and number of TB cases indicate that this problem is still not under control. The World Health Organization (WHO) reported that in 2020, 1.5 million people died from TB, with approximately 10 million people suffering from TB worldwide. The bacteria that cause TB can be transmitted through coughing, sneezing, or spitting, potentially infecting others (WHO, 2021).

Indonesia, as one of the countries with the <https://journal.pubsains.com/index.php/jps>

highest TB cases in the world, faces a significant disease burden. The number of TB patients in Indonesia is estimated to reach 845,000 people, with around 98,000 deaths, or the equivalent of 11 deaths per hour (Ministry of Health of the Republic of Indonesia, 2021). However, only about 67% of these cases are detected and treated, leaving around 283,000 people at risk of transmitting the disease to others. An individual with active TB can transmit the disease to 5-15 other people through close contact within a year, making intra-family transmission a serious concern (Kaiser Family Foundation, 2021).

West Java Province is the region with the highest TB incidence in Indonesia, followed by East Java and Central Java Provinces. Until 2019, there were more

than 123,000 active TB cases recorded in West Java Province (Dinas Kesehatan Prov. Jabar, 2019). Among the regions in West Java, Depok City records a significant number of TB cases. In 2020, there were about 3,311 active TB cases recorded in Depok City (Dinkes Kota Depok, 2020). Curug Sub-district, which is part of Depok City, is included in the working area of Cimanggis Community Health Center. Until November 2021, Cimanggis Community Health Center had treated 24 active TB patients undergoing treatment. However, the treatment success rate and case detection have not yet reached the desired target. The current success rate is 87% of the 90% target. Additionally, the detection and treatment rates are still at 33.8% (Puskesmas Cimanggis, 2021).

When a family member experiences health problems, it can impact various aspects of their lives, both physically, emotionally, and socially. The disease suffered by family members can disrupt communication, alter family activity patterns, and affect roles within the family (Broekema et al., 2020). Additionally, emotional reactions such as fear, confusion, sadness, worry, and difficulty accepting new situations generally arise when families first learn of a family member experiencing a chronic illness, including TB (Kartika et al., 2015).

TB is one of the chronic diseases that impacts family life. TB tends to have social implications on family members, causing feelings of shame, resentment, and guilt within the family. A study in Nepal focusing exclusively on the stigma and discrimination associated with this disease found that both patients and families prefer to isolate themselves from the general community (Baral et al., 2007). Considering the high prevalence of TB globally and nationally, as well as the significant death toll, the role of the family in providing care and support to TB patients is crucial. Caring for family members infected with TB can have positive effects on the overall health and well-being of the family (Prabawa et al., 2018). However, family members providing intensive care may also experience emotional and physical burdens, impacting the quality of care provided (Beach & Schulz, 2017). Support from community nurses can help alleviate the caregiving burden on families (Van Houtven et al., 2011). Studies indicate that

collaboration between family members and community nurses in providing home care is crucial (Ris et al., 2019).

The family nursing approach views the family through five elements: (1) Family as context, (2) Family as a group of members, (3) Family subsystems as the focus of care, (4) Family as a patient, and (5) Family as part of society. Within this framework, the family plays a significant role in healthcare, including identifying problems, making decisions, providing care, modifying the home environment, and utilizing healthcare services (Friedman et al., 2010). Providing care to families can empower them to manage the disease more effectively, with a more controlled impact on family life. The family-based approach has proven successful in helping families adapt to life with the disease, which may have been previously challenging to cope with (Stones, 2020).

Therefore, to enhance the understanding and skills of families in caring for TB patients, healthcare professionals, particularly community nurses, implement Family Nursing Care within the context of TB issues. The objective of this case study is to provide an overview of the implementation of nursing care within families facing TB-related issues by delivering comprehensive and effective care to manage the health condition of family members infected with TB.

Methods

The method used in this study is a case study (Houghton et al., 2015), which focuses on the nursing care process approach (Heale & Twycross, 2018). This approach was chosen because it provides an opportunity to explore the complex aspects and specific contexts related to family nursing care in TB control. The nursing care process used consists of five stages: assessment, diagnosis, intervention, implementation, and evaluation (Stonehouse, 2017). In the assessment stage, necessary information about the family and members suffering from TB is systematically collected using the Family Nursing Model (FCN) theory by Friedman. The FCN theory emphasizes a family-centered approach in nursing care that addresses the complexity of family dynamics and interactions, providing a strong foundation for understanding the family's role in the context of TB care tested in this case study

(Friedman et al., 2010).

The results of this assessment stage form the basis for determining the diagnosis. Diagnoses are made based on the gathered data, which will serve as a reference in determining necessary interventions and expected outcomes. Each stage is interconnected and forms a structured framework. In designing and implementing nursing care, standards serve as important guidelines. Diagnosis, intervention, and evaluation of nursing care refer to the Indonesian Nursing Diagnosis Standard (SDKI) (PPNI, 2017), the Indonesian Nursing Intervention Standard (SIKI) (PPNI, 2018), and the Indonesian Nursing Outcome Standard (SLKI) (PPNI, 2019). These three standards provide a comprehensive foundation for taking directed and measurable steps in the nursing process.

The sample in this case study is a family with a member diagnosed with TB. The sample selection is based on recorded visit data at the Cimanggis Health Center, Depok City. The sample was chosen because it represents cases relevant to the issues under investigation. A series of nursing care is conducted for three months from November 2022 to January 2023 with a visit frequency of twice a week. This timeframe covers the entire nursing process involving assessment, diagnostic process, determination of interventions and implementation, and evaluation. This comprehensive time approach allows for an in-depth understanding of the effectiveness and impact of the applied interventions.

The implementation of nursing care is carried out by SBS, a General Nurse who specializes in Community Nursing and has obtained a Nurse Register Certificate (STR). This case study not only involves technical aspects but also incorporates ethical principles in the implementation of nursing care, including respecting the rights and dignity of the family, maintaining confidentiality of the information provided, and providing interventions with high responsibility and concern for the family's well-being (PPNI, 2016).

In the context of TB cases within the family, respecting the rights and dignity of the family means respecting the decisions and preferences of the family regarding the care of infected family

members. During care plan planning, nurses consider treatment options and medical actions according to the family's preferences. Moreover, maintaining confidentiality of information regarding the diagnosis and health condition of family members infected with TB is crucial. Nurses ensure that this information can only be accessed by authorized parties and provided with permission from the family or the concerned patient. Nurses provide care with full responsibility and concern for the family's well-being by clearly explaining recommended care plans to the family, providing comprehensive information about side effects and risks, and ensuring that the family feels heard and supported at all stages of care.

Results

The results of this case study provide a comprehensive overview of the implementation of family nursing care in the context of TB care. Through various steps and processes, the obtained information provides deep insights into how the family-centered approach in nursing care plays a role in improving the care and well-being of family members affected by TB. The following are the systematic summarized results of the case study to provide an in-depth understanding of the practical implications and significant findings generated, starting from the assessment process, determination of diagnosis, and implementation of interventions, implementation, and evaluation.

Nursing Assessment

The nursing assessment of Mr. D, aged 56, living with his wife (Mrs. S, 51 years old) and their children (Child D and Child B). This case study details the assessment results that Mrs. S, Mr. D's wife, has been identified as suffering from Pulmonary TB since September 2021. Persistent cough symptoms for 3 weeks prompted Mrs. S to seek treatment at the Health Center. Mr. D's family is a nuclear family type, consisting of a husband, wife, and children. Mr. D is of Javanese descent, settled in Depok after marriage, and uses Indonesian with a slight mixture of Javanese. Mr. D's family is Muslim and tends to manage illnesses by buying medicine from a local store first before going to the Health Center if the condition worsens. Currently, Mr. D's family is in the family development stage with teenage children.

Although Mrs. S gives her children freedom, open communication within the family still needs improvement, especially between Mr. D and his children. Mr. D's house measures 6m x 10m, consisting of 3 bedrooms, 1 living room, 1 bathroom, and 1 kitchen. Limited lighting is present in the living room, and air circulation is only available in the living room.

The assessment results indicate that Mr. D's family's knowledge of TB is still limited, and they face challenges in caring for Mrs. S who is ill. Further observation reveals more complex issues. Mrs. S, who is still active at home, rarely wears a mask to protect the family from transmission. Mr. D revealed that Mrs. S would only go to the Health Center when her condition worsened. Health assessment of Mrs. S revealed several conditions that require serious attention. Mrs. S's weight drastically decreased from 55 Kg to 45 Kg, and symptoms such as nausea, vomiting, and continuous loss of appetite are still present.

Nursing Diagnosis

The analysis results of the data found identify two nursing problems faced by Mr. D's family, namely Ineffective Health Maintenance (D.0117) and Nutritional Deficit (D.0019). Both diagnoses were generated by following the characteristics and signs and symptoms set by the nursing diagnosis standards in Indonesia and adjusted to the findings from the assessment process. From these two diagnoses, the next step is to determine the priority of family nursing problems based on the nature of the problem, potential problem changes, possibility of preventing problems, and the clarity level of the problem (Maglaya, 2009). After calculation, the Ineffective Health Maintenance diagnosis (D.0117) obtained a score of (3.2/3), while the Nutritional Deficit diagnosis (D.0019) obtained a score of (3.1/3). Therefore, the primary nursing diagnosis addressed in Mr. D's family is Ineffective Health Maintenance (D.0117).

Nursing Interventions, Implementation, and Evaluation

Interventions, implementation, and evaluation are based on the five Family Health Tasks (FHT), namely FHT 1: identifying problems; FHT 2:

making decisions; FHT 3: providing care; FHT 4: modifying the home environment; and FHT 5: utilizing health facilities. The primary tasks in family nursing care are essential steps to ensure effective and holistic care for family members. These tasks play a crucial role in helping families cope with health situations and maintaining the well-being of family members.

1. Identifying Problems

This stage involves recognizing and understanding the health issues faced by family members. Identifying symptoms, diagnosis, and potential health risks help families gain a clear understanding of the health condition they are facing. Intervention efforts to help families understand the health problems experienced by sick family members include Health Education related to TB (I.12383) and Disease Process Education (I.12444). These efforts include steps such as identifying the extent to which the family is ready and capable of receiving information about TB, providing health education materials and media about TB, explaining the definition of TB and its causes, informing about TB signs and symptoms, explaining potential complications if TB treatment is not regularly undertaken, teaching how to reduce treatment side effects, providing guidance on healthy living behaviors. Evaluation shows an improvement in TB knowledge (I.12111) increased to scale 5 on a scale of 1 to 5 (Table 1).

2. Making Decisions

Making careful decisions regarding treatment and health condition management is a crucial responsibility. Families are required to consider various available treatment alternatives, understand possible side effects, and plan steps to ensure optimal recovery. The intervention applied is through family engagement (I.14525). Family engagement facilitates family members' participation in emotional and physical care. Steps include identifying the family's readiness to engage, building therapeutic relationships, discussing care plans, supporting the family in decision-making, and encouraging the family to be proactive in care. Evaluation shows an increase in family support (I.13112) in meeting individual needs with a score of 5 (scale 1-5) (Table 1).

3. Providing Care

This task focuses on implementing care actions appropriate to the family member's health condition. It includes administering medications, physical therapy, or wound care. Intervention supporting adherence to the treatment program (I.12361) aims to support adherence to the treatment program. It includes identifying the level of compliance, commitment to the program, arranging accompaniment schedules, recording activities, discussing supporting or hindering factors, involving the family, providing information, giving advice, and ensuring the family feels supported. Evaluation shows an improvement in family function (I.13114) in meeting family member needs with a score of 5 on a scale of 1-5 (Table 1).

4. Modifying the Home Environment

Changes in the home environment support the healing process and the well-being of sick family members. Education interventions on cleanliness behavior patterns (I.12439) aim to improve or maintain personal and environmental cleanliness behaviors. It includes identifying the family's readiness and ability, monitoring cleanliness maintenance capabilities, practicing together, explaining potential problems, and teaching how to maintain cleanliness. Evaluation shows an improvement in family health behaviors (I.12107) with a score of 5 on a scale of 1 to 5 (Table 1).

5. Utilizing Health Facilities

This task focuses on the family's understanding of the importance of collaboration with healthcare providers and the implementation of medical procedures. Introduction to healthcare facilities interventions (I.14549) aim to increase knowledge and understanding of service regulations. It includes identifying knowledge, explaining service regulations. Evaluation shows an improvement in family health status (I.12108) with a score of 5 on a scale of 1 to 5 (Table 1).

These five tasks are interrelated and contribute to forming a comprehensive approach to family nursing care. Through understanding and

implementing these tasks, families can provide the best care for family members in need and optimize the well-being and recovery of family members.

Table 1. Evaluation Results of the 5 Family Health Tasks

No	Criteria Outcome	Initial Score	Final Score	Description
TUK 1: Family is able to identify health issues. The expected outcome is increased family knowledge level (L.12111)				
1.	Ability to explain knowledge about TB	1	5	Increased
2.	Demonstrates willingness and interest to learn about TB	2	5	Increased
TUK 2 : Family is able to make appropriate decisions. The expected outcome is increased family support (L.13112)				
1.	Family expresses willingness to support sick family members	2	5	Increased
2.	Working together with sick family members in determining treatment	1	5	Increased
3.	Collaborating with healthcare providers in determining treatment	2	5	Increased
TUK 3 : Family is able to provide care. The expected outcome is increased family function (L.13114)				
1.	Fulfillment of family member needs	2	5	Increased
2.	Family members perform expected roles	1	5	Increased
3.	Allocation of responsibilities to each family member	1	5	Increased
TUK 4 : Family is able to modify an adequate environment. The expected outcome is family health behavior (L.12107) in creating a clean and healthy environment				
1.	Ability to take preventive actions for health issues	1	5	Increased
TUK 5: Family is able to utilize available healthcare services. The expected outcome is family health status (L.12108)				
1.	Access to healthcare facilities	1	5	Increased

Discussion

TB control involves health efforts not only focusing on promotive and preventive aspects but also considering curative and rehabilitative aspects. The primary goal of this control is to maintain and protect public health, reduce morbidity rates, prevent disability or death, break the chain of transmission, prevent drug resistance, and reduce the negative impacts caused by TB (Kementerian Kesehatan RI, 2016). In this framework, the importance of rapid and accurate diagnosis, as well as treatment with correct drug administration, becomes key factors in the cure and prevention of TB. However, if TB management is not timely and appropriate, it can be fatal, where two-thirds of TB patients may experience death (KNCP, 2021).

The results of this qualitative case study indicate that the nursing problems faced by families are related to ineffective health maintenance. By definition, ineffective health maintenance is a condition in which families are unable to identify, manage, and seek help to maintain health (PPNI, 2017). This is due to many factors, including cognitive barriers regarding the disease experienced by family members or the failure to fulfill family developmental tasks. The above case shows that the family demonstrates a lack of understanding of healthy behaviors and is unable to perform healthy behaviors.

Interventions are based on five family health tasks: identifying problems, making decisions, providing care, modifying the home environment, and utilizing health facilities. The intervention aimed at enabling families to recognize health problems is health education and teaching about the disease process. Health education and teaching about the disease process are essential strategies in TB management. Health education and teaching about the disease process are important strategies for providing knowledge and understanding to families affected by TB, with the aim of increasing awareness of this disease, improving adherence to treatment, and preventing further transmission (Idris et al., 2020).

In the context of families being able to make decisions, the intervention carried out is family involvement. This means that the family's role has a significant influence on decision-making regarding

necessary care and interventions (Truzyan et al., 2018). Family involvement is a crucial aspect in ensuring appropriate decision-making and ongoing support for patients affected by the disease (Behzadifar et al., 2015). Family involvement can be realized through discussions about treatment plans, drug administration procedures, and handling possible side effects. These discussions allow families to better understand the importance of treatment adherence and how they can actively contribute to ensuring optimal care for patients.

Furthermore, interventions are carried out to ensure that families can provide adequate care to sick family members, including adherence support interventions for treatment programs. The Indonesian Ministry of Health has established the TOSS TB program (Find Tuberculosis, Treat to Cure) aimed at supporting TB patient treatment. This is a community-based approach designed to detect suspected patients who have contact with active TB patients, conduct immediate diagnosis for confirmation, provide treatment for cure, and maintain treatment consistency to stop TB transmission (Kementerian Kesehatan RI, 2016). In the context of the nurse's role as a medication adherence supervisor (PMO), it is crucial in efforts to reduce disability and death rates due to TB. A qualitative study shows that the PMO's role includes overseeing medication intake, encouraging regular medical visits, reminding about sputum examination, and educating family members of symptomatic TB patients to seek immediate medical attention (Aryantiningsih et al., 2020).

In efforts to control TB infection, the Directly Observed Therapy (DOTS) strategy has been implemented at the community health center level. DOTS focuses on finding and curing patients by prioritizing TB patients. This approach has been proven to reduce transmission and prevent the development of MDR (Multi Drugs Resistance) - TB (Minnesota Department of Health, 2020). The focus is on finding and curing patients as an effective step in preventing TB transmission and breaking the transmission chain (Kementerian Kesehatan RI, 2016).

The importance of support for TB patients is emphasized because this support indirectly helps

treatment success through medication reminders, in-depth understanding of the patient's condition, and encouragement for regular medical visits (Horne et al., 2013). One model used in community interventions is the Health Belief Model (HBM), which identifies factors such as susceptibility, severity of risk, benefits of action, barriers to action, self-efficacy, and cues to action that influence health behavior (Stanhope & Lancaster, 2016). Public awareness of TB vulnerability and preventive actions is important in preventing transmission.

Furthermore, in developing family-based interventions, the Family Center Nursing approach by Friedman is relevant because it recognizes the family as the entry point in health services and as support for individuals (Friedman et al., 2010). Family support is key, including medication reminders, in-depth understanding of the patient's condition, and encouragement for regular medical visits (Horne et al., 2013). Research also shows that health coaching can improve adherence and infection prevention, which positively impacts infection prevention ($p<0.001$), meaning it positively affects infection prevention (Hanif et al., 2020). Therefore, family-based interventions, such as the PIS-PK program (Healthy Indonesia with a Family Approach Program), involving Health Workers visiting family homes to provide support, become potential solutions to improve TB treatment success. Through such efforts, community nurses can integrate the PIS-PK program into family nursing care practice.

Conclusion

This study successfully highlights the significant potential of a family-based care approach in addressing TB. Nursing care in this study illustrates how family involvement as partners in care can enhance the effectiveness of managing this disease. The study findings provide valuable contributions to healthcare, emphasizing the need to integrate families into the care process and empower them to fulfill the five family health tasks: identifying problems, making decisions, providing care, modifying the home environment, and utilizing health facilities. Fulfillment of these five family health tasks provides comprehensive insights into how active family involvement in the care process

can have positive impacts on overcoming TB. The results of this study offer practical guidance for healthcare professionals in developing more inclusive, holistic, and family-focused care strategies, thereby optimizing treatment outcomes for TB patients.

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